A.D. 1826 . . . . . N° 5351.

SPECIFICATION

OF

FRANCIS HALLIDAY.

APPARATUS TO PROMOTE THE ESCAPE OF SMOKE FROM CHIMNEYS.

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Apparatus to promote the Escape of Smoke from Chimneys.

HALLIDAY'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, FRANCIS HALLIDAY, of Ham, in the County of Surrey, Esquire, send greeting.

WHEREAS His present most Excellent Majesty King George the Fourth, by His Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Twenty-fifth day of April, One thousand eight hundred and twenty-six, in the seventh year of His reign, did, for Himself, His heirs and successors, give and grant unto me, the said Francis Halliday, His especial licence, that I, the said Francis Halliday, my ex̃ors, adm̃ors, and assigns, or such others as I, the said Francis Halliday, my ex̃ors, adm̃ors, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick upon Tweed, and also in all His said Majesty's Colonies and Plantations abroad, my Invention of "AN APPARATUS OR MACHINE FOR PREVENTING THE INCONVENIENCE ARISING FROM SMOKE IN CHIMNEYS, WHICH I DENOMINATE 'A WIND GUARD;'" in which said Letters Patent is contained a proviso obliging me, the said Francis Halliday, by an instrument in writing under my hand and seal, particularly to describe and ascertain the nature of my said Invention, and in what manner the same is to be performed, and to cause the same to be inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

Halliday's Improved Apparatus for Preventing Smoke in Chimneys.

NOW KNOW YE, that in compliance with the said proviso, I, the said Francis Halliday, do hereby declare that my said Invention of an apparatus or machine, which I denominate a wind guard, for preventing the inconvenience arising from smoke in chimneys, is described and ascertained in and by the Drawings hereunto annexed, and by the following description thereof, that is to say:—

Figure 1 of the said Drawing is a horizontal plan of the apparatus or wind guard, and Figure 2 is an upright elevation of the same, drawn to a scale of one third of the real size. The same letters of reference denote the same parts in both. A, A, Figure 2, represents a part of the brickwork at the top or upper part of the stack or chimney; B, B, is the bottom plate of the apparatus or machine; and C, C, is the top plate thereof; and D, D, D, D, are four small upright pillars, by which the two plates B and C are firmly fastened together, one over the other, so as to form a fixed frame for the machine. The plates B and C are of a square form, as is shewn in Fig. 1, and are fixed in a horizontal position over the top of the flue of the chimney or passage for the smoke; the centre of the bottom plate B, B, is perforated with a round opening or aperture, which allows the smoke to pass upwards and escape out of the flue of the chimney; a raised circular rim is formed around the edge of this aperture, as is shewn at *a*, *a*, Fig. 2, and *b*, *b*, is a similar circular rim, which is formed at the under side of the upper plate C; a cross bar *d*, Fig. 1, extends diametrically across the circular aperture in the centre of the lower plate B, and in the middle of this bar a steel pin *p*, with a point, is fixed, the sharp conical point of the pin being upwards. This point is exactly in the centre of the aperture through the lower plate B, and also of the circular rims *a*, *a*, and *b*, *b*, and the point serves as the centre of motion for the lower end of an upright axis or spindle E, to which the moveable part of the machine or wind guard G, H, is fixed, so as to turn or be carried round with the spindle. This spindle E, E, passes through an opening in the centre of the upper plates C, C, and it is securely retained in an upright or vertical position by three small circular wheels or antifriction rollers *e*, *f*, *g*, which are mounted upon pivots in a small frame situated at the top of the upper plate C, C, and the three rollers surround the axis or spindle on every side, so as to confine it in the upright position, but leaving it at liberty to turn around very freely. F, F, are two short arms, which project horizontally outwards from the upright axis E, E, and at the ends of them the moveable plate or wind guard G, H, is fixed, so as to stand up in a vertical position at one end side of the circular rims *a*, *a*, and *b*, *b*, in the space between the top plate C and the bottom plate B, but the said wind guard G, H, being affixed to the spindle E

by the arms F, F, it is capable of turning round so as to stand at any side of the chimney from which the wind blows, in order to guard off the wind and prevent the inconvenience arising from the smoke being blown down the chimney by the wind which blows over and across the top of the flue or chimney; at the upper end of the upright spindle E a wind vane K, L, is fixed fast, so as to turn the spindle round with it; this wind vane may be shaped like an arrow, as is represented in Figure 2, with broad flat wings at one end for the wind to act upon, so that it may turn the arrow and its spindle about until the arrow points to the direction of the wind. The two arms F, F, which sustain the wind guard are fixed into the spindle E, E, on the same side as the pointed end of the arrow or wind vane, so that when the arrow assumes the direction of the wind the wind guard G, H, will be placed exactly at the windward side of the aperture through which the smoke is intended to escape. The wind guard may be either a flat plate, as is represented by the dotted line I, I, Fig. 1, or else it may be bent to an angle in the middle, as is shewn at G, H, in the plan, Fig. 1; the breadth of the plate G, H, or the vertical height of the wind guard, must correspond to the space between the top and bottom plates B, B, and C, C, with a sufficient clearance to avoid any chance of the wind guard G, H, touching either of the plates so as to impede its free motion. The circular rims *a*, *a*, and *b*, *b*, project so much from the top and bottom plates B, B, and C, C, as to prevent any wind blowing over the top edge or under the bottom edge of the wind guard G, H, as that would impede the free exit of the smoke from the aperture through the centre of the bottom plate. The wind guard does not touch the said circular rims *a*, *a*, or *b*, *b*, nor any of the fixed parts of the machine. In some cases I propose to make the wind guard in the form represented at G, H, W, X, *r*, *r*, *t*, *t*, in Fig. 3 and 4 of the Drawing, with an opening through the middle of the wind guard to allow the wind which strikes against it to pass through, and a passage is provided to convey that wind across the aperture of the lower plate B at which the smoke is intended to issue without allowing the wind to mix with that smoke, but the said passage is adapted to deliver the current of air or wind which passes through the opening in the centre of the wind guard at the opposite or leeward side of the chimney, and then mixes with the smoke which has already escaped from the chimney into the open air, and this mixture of the wind with the smoke assists that smoke to pass away, so as to leave space for the exit of the smoke which is to follow it out of the chimney. When the wind guard is made with a passage across the chimney as aforesaid, the part which is presented to the wind

must be bent at an angle, as shewn at G, H, in the plan, Fig. 3, the interior of that angle being presented to the wind so as to form a funnel to gather in the wind to the middle of the wind guard, and the opening through which the wind is entended to pass is in the middle of the angle. W, X, is the passage leading from this opening to convey the wind across the chimney; the passage is composed of two vertical flat plates, as is shewn in the elevation of Figure 4, and they are joined together at the top and bottom by other narrow plates riveted together, so as to form a flat trunk, which is very narrow upon edge; the spindle E, E, must not pass through the passage W, X, because it is so narrow that the spindle would impede the current of wind; the stem of the spindle E, E, is therefore made with a flat foot *r*, *r*, Figure 4, which applies upon the narrow top of the passage W, X, and is fastened thereto by rivets; also, at the lower part of the said passage W, X, a similar flat piece *t*, *t*, is rivetted, and from the middle of this a short stump E, descends to form the lower end of the spindle E, E, and this stump has a hole in the lower end to rest upon the conical point of the steel pin *p*, which is fixed in the middle of the cross bar *d*, *d*. *v*, *v*, are two small bars, which are applied on each side of the passage W, X, to strengthen the central part upon which the spindle is fixed. Note.—The lower end of the upright spindle E, E, Figure 2, or the stump E, Figure 4, must be made of steel, and hardened, and the point of the pin *p* must also be made of steel, and hardened, that the wind guard may move freely and not be liable to wear out by the friction. The wind vane K, L, which is fixed at the upper end of the upright spindle E, E, may be made of any form, according to fancy, provided that one end is made broad and suitably disposed to receive the action of the wind, in order to turn it exactly into the direction in which the wind blows; the opposite end of the wind vane should be narrow or pointed, so as to present no surface to the wind, and the wind guard G, H, must in all cases be fixed on the same side of the spindle as this narrow or pointed end of the wind vane, in order that the action of the wind upon the vane may at all times turn the wind guard round, so as to place it exactly at the windward side of the chimney. The broad end of the wind vane may be either composed of one thin plate paced edgeways in a vertical plane upwards, or else it may be composed of two such vertical plates fixed together at the part nearest to the spindle E, E, but with their remote ends separated from each other, so as to spread out at an angle from each other, the vertex of that angle being towards the narrow or sharp end which is to present itself to the wind. The wind striking against both of the two broad plates which are inclined to each other at the same time will tend to

press them in opposite directions, and these contending pressures will keep the vane and the wind guard more steadily in the direction of the wind than if the wind vane were made with only one vertical plate to turn its edge to the wind. *m* is a small arm, (shewn only in Figures 1 and 2,) which is fixed to the upright spindle E, E, and extending outwards to a suitable distance, and the end is bent so as to bend round the projecting rim *b*, *b*, so as to be very near to the rim without actually touching; when the spindle and its wind guard are turned round by the wind, the arm *m* passes round the circular rim *b*, *b*, so as to clear away and scrape off any accumulation of soot which may collect upon and adhere to that rim. The three rollers *e*, *f*, *g*, which are placed round the vertical spindle E, E, have each a short upright axis with a pivot at each end; the lower pivots are received in three holes made in the upper plate C, C, and the upper pivots are received in three corresponding holes in a small cover plate *h*, which is fixed above the top plate C, by means of three small studs, so as to leave a suitable space between the upper plate C, C, and the cover plate *h*, for the three rollers to act in. Figures 3 and 4 of the Drawing represent a double machine or wind guard adapted for two chimneys or flues which are formed in the same stack; the same letters of reference are used to denote the same parts as those in Figures 1 and 2, and therefore it is not necessary to repeat the whole of the description. The upper plate C, C, C, C, is supported and affixed to the lower plate B, B, B, B, by six pillars D, D, D, D, D, and each of these plates is made of double the size of the plates B and C, represented in Figures 1 and 2, so as to admit of two circular openings being made through the lower plate B, B, B, at a suitable distance apart to correspond with the distance between the two flues of the chimneys; each opening has a projecting circular rim *a*, *a*, and across each opening is a cross bar with a steel point *p* in the centre, to support an upright spindle E, E, and E, E. Each spindle is furnished with a suitable wind guard G, H, G, H, to keep off the wind from the respective opening through which the smoke is to issue, and each spindle E, E, & E, E, may have a separate wind vane fixed upon it in the manner already described in Figures 1 and 2, but only of such a length that those vanes may turn round independantly of each other, without interference or otherwise the two spindles E, E, and E, E, may be connected by toothed wheelwork in such a manner as that both spindles shall turn round togethef with a corresponding motion, and then one wind vane being fixed upon one o the upright spindles, it will govern both wind guards; for this purpose a small mitre or bevilled wheel M and N must be fixed upon each of the spindles E, E, and E, E, just above the frame which contains the three rollers *e*, *f*, *g*, and the

teeth of these wheels M and N must be engaged with those of two other bevelled wheels O and P, which are fixed upon the opposite ends of a horizontal axis R, R, which extends from one wheel to the other; all the four wheels M, N, O, and P, being of the same size and having the same number of teeth, the two spindles E, E, and E, E, with their respective wind guards, will turn round one as much as the other and in the same directions, whereby a suitable wind vane being fixed upon the upper end of one of the spindles E, E, it will regulate both the wind guards and turn them to the windward side of the apertures through which the smoke is to escape from the flues respectively. The pivots at the ends of the horizontal axis R, R, are supported in small brackets which are affixed to the upper side of the upper plate C, C. S is a cover to enclose the wheelwork and the horizontal axis R, and preserve them from the effects of the weather; and, in like manner, when three, four, or more chimneys or flues are situated side by side, close together, in the same stack, they may all be furnished with wind guards of the kind represented in Figures 3 and 4, but constructed with a greater number of upright spindles E, E, and moveable wind guards G, H, and by prolonging the horizontal axis R, R, and applying a pair of bevilled wheels similar to M, O, for each upright spindles E, E, all the said wind guards may be governed by one wind vane if thought desirable, or when six or eight wind guards are applied to as many chimneys upon the same stack, then two vanes may, if prefered, be applied one on each of the outside spindles, and each of those vanes may govern three or four of the wind guards, so as to serve for as many of the flues. The bottom plate B, B, B, B, of my machine or apparatus should be of the same size as the brickwork of the stack or chimney, or nearly so, and it may be fixed on the top of the said brickwork with a bedding of mortar; the circular aperture through that bottom plate (or the circular apertures, if more than one,) being placed exactly over each of the flues or passages for the smoke respectively; the weight of the apparatus will be sufficient to keep it steady upon the brickwork. And as to the dimensions of my said machine or apparatus, they may be ascertained by measuring upon the Drawing, according to the scale of feet and inches thereupon, the said Drawings being upon a scale of one third of the real size, but those dimensions, as well as the form of the said machine or wind guard, may be varied at the discretion of the workman who shall construct the same. And as to the materials of which my said machine or apparatus may be made, cast iron is to be preferred for the fixed frame, on account of its cheapness, and because it will withstand the weather better than wrought iron, but wrought iron plates may be used, and

FIGURE 1.

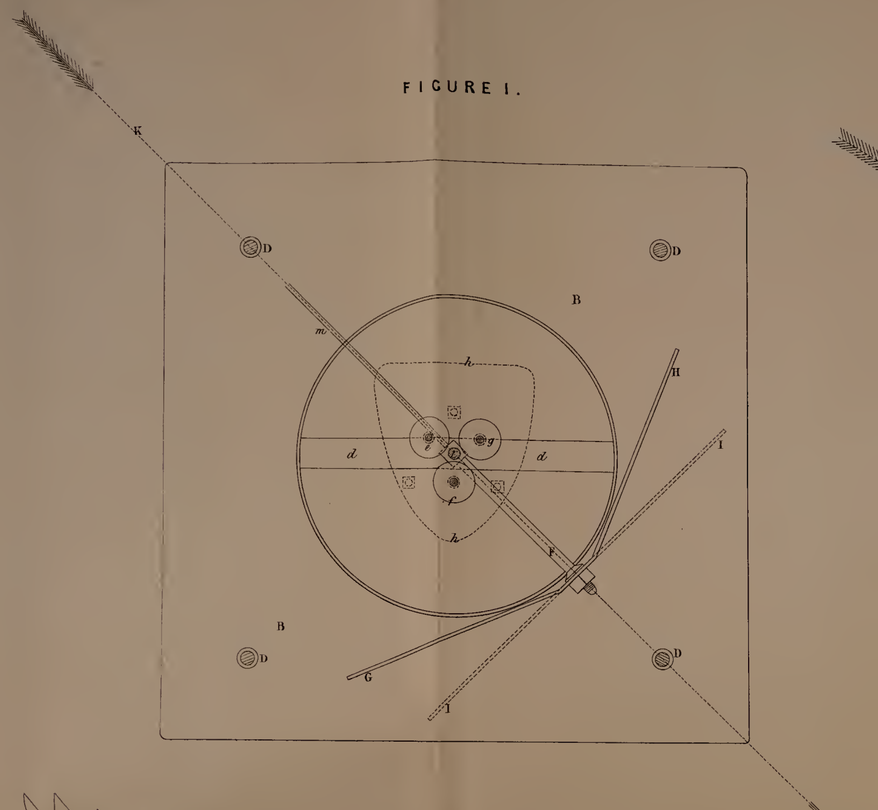


FIGURE 2.

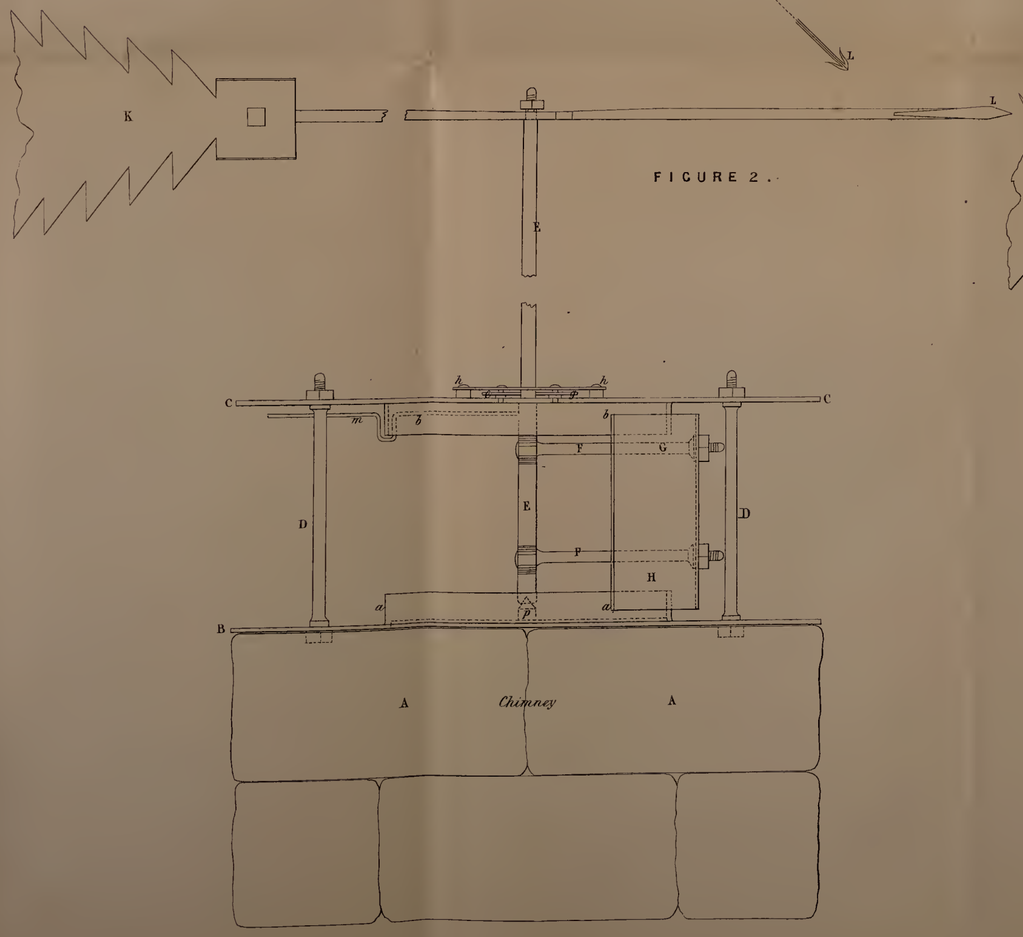


FIGURE 3.

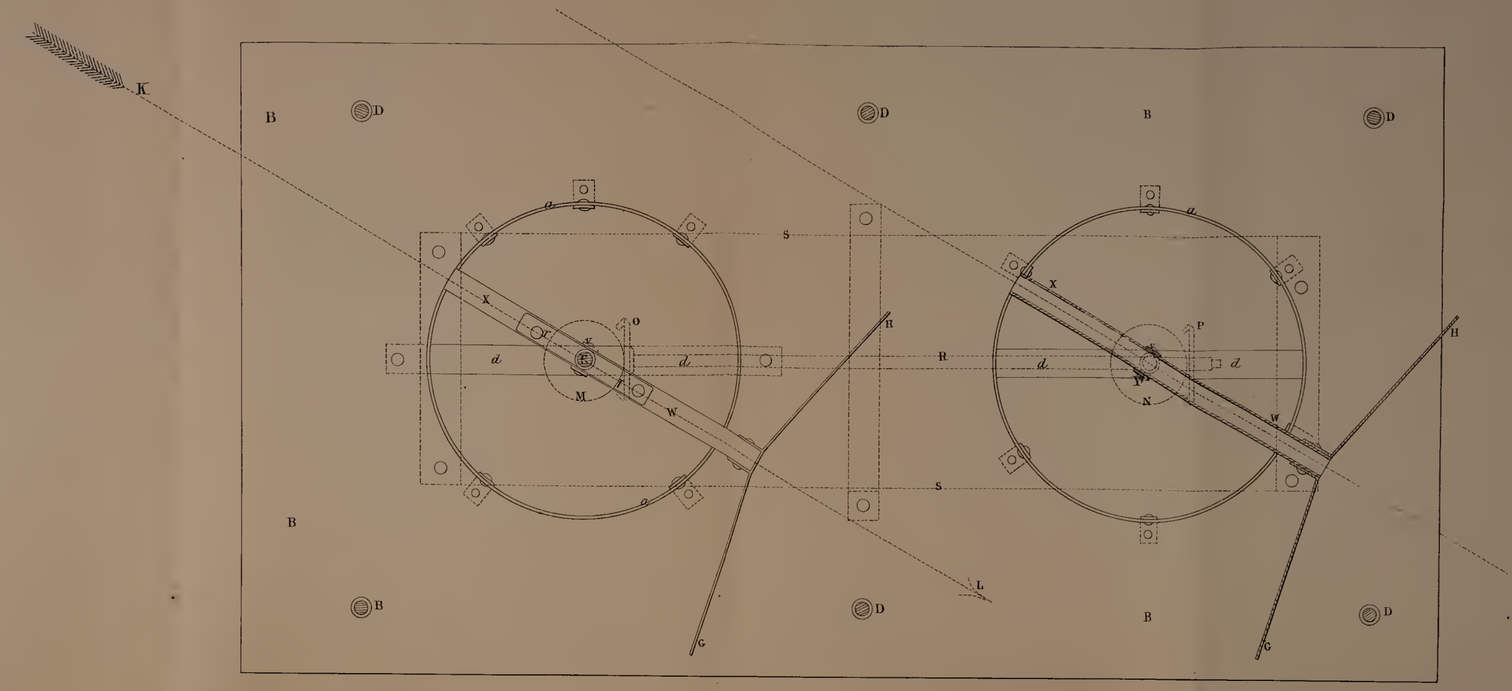
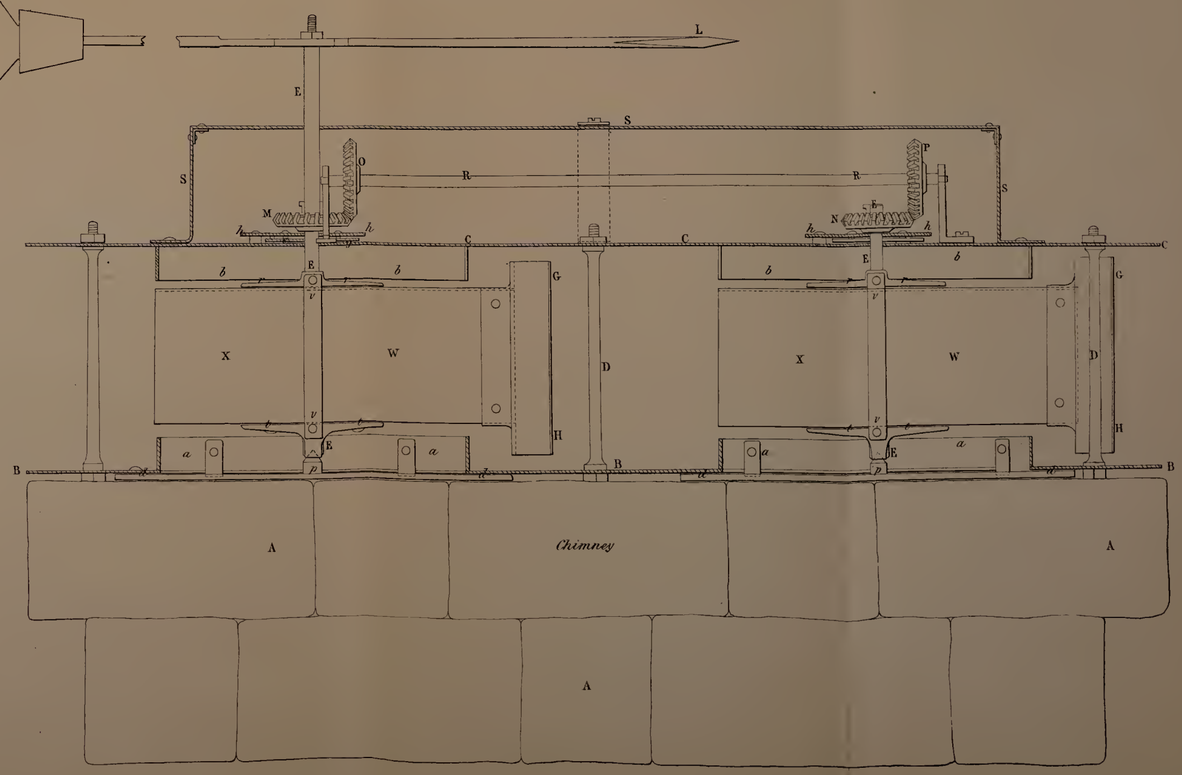


FIGURE 4.



The enrolled drawing is partly colored.

LONDON: Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE
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Malby & Sons. Lith

the moving parts of the machine may be made of iron plate, painted and varnished, or they may be made of copper.

In witness whereof, I, the said Francis Halliday, have hereunto set my hand and seal, this Twenty-fifth day of October, in the year of our Lord One thousand eight hundred and twenty-six.

FRANCIS (L.S.) HALLIDAY.

AND BE IT REMEMBERED, that on the Twenty-fifth day of October, in the year of our Lord 1826, the aforesaid Francis Halliday came before our said Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and everything therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

WINGFIELD.

Inrolled the Twenty-fifth day of October, in the year of our Lord One thousand eight hundred and twenty-six.

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